

Curling, Donna v. Raffensperger, Brad

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1 IN THE UNITED STATES DISTRICT COURT
2 FOR THE NORTHERN DISTRICT OF GEORGIA
3 ATLANTA DIVISION

4 DONNA CURLING, et al.,
5 Plaintiffs,

CIVIL ACTION FILE

6 vs.

NO. 1:17-cv-2989-AT

7 BRAD RAFFENSPERGER, et al.,
8 Defendants.

9
10 DEPOSITION OF
11 J. ALEX HALDERMAN, Ph.D.
12 November 17, 2021
13 8:03 a.m.

14 TAKEN BY REMOTE VIDEOCONFERENCE
15 Robyn Bosworth, RPR, CRR, CRC, CCR-B-2138
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8		policymakers must work with	
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1 County, Michigan November 2020

2 Election Incident"

3 Exhibit 11 "Will Georgia's new voting 251

4 machines solve election

5 problems – or make them

6 worse?"

7 Exhibit 12 Tweet from Michigan 257

8 Engineering

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9 Also Present:

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1 between retail and electronic -- a broader
2 electronic fraud, though, you'd agree that fraud
3 perpetuated at a single BMD is more like hand-marked
4 paper ballot retail fraud, wouldn't you?

5 A Again, I don't think they're -- I don't
6 think they're directly comparable because even a
7 single BMD might process a thousand ballots or more
8 during a given day, and with the same amount of
9 attacker effort, it would be quite a lot of work to
10 change the physical loads on a thousand pieces of
11 paper.

12 Q So, Dr. Halderman, I know that you've
13 developed malware that affects DREs. We talked
14 about that earlier in the case. You developed
15 malware that affects BMDs, like the Dominion ICX
16 system.

17 Have you ever developed any malware that
18 would alter votes on both a DRE, like the AccuVote
19 system previously used in Georgia, and Dominion ICX
20 units?

21 A What do you mean? The same piece of
22 malware?

23 Q Yes, whether the same piece -- have you
24 ever developed the same piece of malware that would
25 alter votes both on an AccuVote DRE and on a

1 Dominion ICX?

2 A I'm -- no.

3 Q You had access to both types of equipment,
4 though, correct?

5 A They're two different platforms. It's
6 like developing an app that would work on Android
7 and on the iPhone. It could be done presumably, but
8 it would be -- you would normally have two different
9 apps that did the same thing.

10 Q And you have never personally developed a
11 single app that would run on both the TSX platform
12 in the DREs and the ICX Dominion platform, right?

13 A Oh, I see. I think I see what you mean.
14 So, no, I've developed malware that would run on
15 each of them that could be presumably packaged
16 together by an attacker who wanted to commit fraud
17 on both, but I haven't packaged a -- different
18 versions together.

19 Q Have you ever developed any malware that
20 would function to alter votes on both the GEMS
21 system, that's G-E-M-S, and the Dominion EMS system,
22 the same piece of malware?

23 A No, but the same caveat that a program
24 that works on one and a program that works on the
25 other could be composed. Programs compose

1 naturally. That's one of the sort of founding --
2 foundational principles of computer software.

3 Q Would you need to know the platform on
4 which the Dominion ICX was running to be able to
5 package a piece of malware as you're describing it?

6 A Yes, you'd need to know some things about
7 the ICX.

8 Q And so if someone developed malware in,
9 say, 2005 or 2006 for a DRE, would someone be able
10 to also design that same piece of malware to
11 function on a Dominion ICX 15 years into the future?

12 A Maybe not on a Dominion -- well, so the --
13 so no, but the attacker -- the way that attackers
14 more frequently work on infecting a first system is
15 to give themselves some way to more easily get back
16 in if they need to later continue the attack or make
17 changes or updates.

18 So malware introduced at an earlier point
19 to equipment or an EMS would likely facilitate an
20 ongoing intrusion.

21 Q But that would require a different piece
22 of software; is that a fair characterization?

23 A Depending on the attacker's objectives, it
24 might.

25 Q But you personally have not developed

1 something that works in both the GEMS system and the
2 Dominion EMS, correct?

3 A Well, they're both Windows systems, so it
4 would not be -- malware that ran on the GEMS system
5 very easily could continue to run on the Dominion
6 EMS system.

7 Q And, again, my question was more specific.
8 Have you personally developed such
9 software?

10 A Oh, excuse me. No.

11 Q Now, Dr. Halderman, you've had access to
12 some AccuVote TSXs that were actually used in
13 Georgia elections, at least images of their internal
14 memory, correct?

15 A That's correct.

16 Q Have you found any evidence of malware
17 installed on those DRE images that you've reviewed?

18 A I haven't. It's difficult to completely
19 rule out because of the nature of malware; and,
20 moreover, I believe I've seen images of -- on the
21 order of 10 DREs out of the tens of thousands that
22 were used in Georgia. So, unfortunately, even if
23 there was a widespread infection, I would have only
24 had a small probability of detecting it by
25 inspecting the images I was provided.

1 Q But to this point, you found no evidence
2 of malware in the images that you've reviewed,
3 right?

4 A With those caveats, yes.

5 Q Now, it's correct to say that you haven't
6 conducted any review of the -- and I will say review
7 any sort of technical forensic review of the eNet
8 voter registration system, correct?

9 A Any forensic review? Well, I have not
10 conducted a forensic review. I've only been able to
11 confirm the vulnerabilities that were reported
12 publicly in 2018.

13 Q And how did you confirm those
14 vulnerabilities?

15 A Those were ones that were visible from
16 outside the system.

17 Q And are you aware whether those
18 vulnerabilities related to the eNet system itself
19 or to some other component of the election system?

20 A I believe they're related to the
21 public-facing voter registration and My Voter
22 Georgia pages, which are a component of the voter
23 registration system.

24 Q So it's your testimony that the My Voter
25 page and the online voter registration pages that

1 are publicly available are components of the State's
2 voter registration database eNet?

3 A They're components of the voter
4 registration system. I'm not sure where the
5 manufacturer defines the orders of its brand.

6 Q You've also had available to you hundreds
7 of GEMS databases post election and pre election
8 from Georgia elections, correct?

9 A That's right.

10 Q And have you found any evidence of malware
11 in any of those GEMS databases that you've reviewed?

12 A I haven't found evidence of malware, again
13 with the caveat that inspection is not a reliable
14 way of ruling out the presence of malware. It can
15 sometimes detect it, but it can't rule it out.
16 Instead what the databases reveal is a pattern of
17 procedural inconsistencies and so forth from
18 jurisdiction to jurisdiction that raise security
19 questions to me but are not indicative by themselves
20 of malware.

21 Q And I want to ask you about a statement
22 you just made, "the inspection is not a reliable way
23 of detecting malware."

24 Is that because malware can sometimes mask
25 its existence in a particular platform?

1 CERTIFICATE

2 STATE OF GEORGIA:

3 COUNTY OF FULTON:

4 I hereby certify that the foregoing transcript
5 was taken down, as stated in the caption, and the
6 colloquies, questions and answers were reduced to
7 typewriting under my direction; that the transcript
8 is a true and correct record of the evidence given
9 upon said proceeding.

10 I further certify that I am not a relative or
11 employee or attorney of any party, nor am I
12 financially interested in the outcome of this
13 action.

14 I have no relationship of interest in this
15 matter which would disqualify me from maintaining my
16 obligation of impartiality in compliance with the
17 Code of Professional Ethics.

18 I have no direct contract with any party in
19 this action and my compensation is based solely on
20 the terms of my subcontractor agreement.

21 Nothing in the arrangements made for this
22 proceeding impacts my absolute commitment to serve
23 all parties as an impartial officer of the court.

24 This the 3rd day of December, 2021.

25 

ROBYN BOSWORTH, RPR, CRR, CRC, CCR-B-2138